

**V. Remarks**

The Examiner's careful and thorough consideration in the application is appreciated. Claims 4, 6-13, 15-22, and 28-43 are pending in the application. The application has been amended to more particularly point out and distinctly claim the subject matter of claims 5 (restated as claim 33), 8, and 9 indicated by the Examiner to be allowable in the August 28, 2003 communication. The new group of claims 35-43 alternatively define an embodiment within the scope of subject matter considered to be allowable. With regard to the various bases of the DETAILED ACTION, applicant responds as follows:

***Drawings***

1. and 2. In FIG. 2A, the designations of "inlet 7a" and "inlet 7b" and "outlet 9a" and "outlet 9b" are corrected; element "206" is changed to -- 20b --; "9b" is changed to -- 1b --; the duplicative "22c" is corrected to -- 22d --.
3. The reference to: element "23" in FIG. 2C is deleted.
4. Corrected drawing sheets follow as Appendix A.

***Specification***

5. The embedded hyperlink is deleted from section [0002].
6. The informalities noted are corrected.
7. Further corrections include the clarifications in Paragraphs [0032] and [0033] associating Figure 1C and Figure 2A.

***Claim Objections***

8. Claims 1 and 24 are cancelled; claim 14 is rewritten as claim 34, and claim 31 is corrected.

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***Claim Rejections - 35 USC § 112***

9. Claim 3 is cancelled and incorporated in claim 33, which rewrites allowable claim 5. The relationships of elements and antecedents have been clarified in accordance with the Examiner's comments concerning claims 6, 8, 9, 12, 13, 15 and 32. Claims 23-27, relating to the processing environment and parameters, in contrast with the apparatus *per se*, are cancelled. The relative terms in claims 29-31 are deleted.

***Claim Rejections - 35 USC § 102***

10. *Claims 1, 2, 10, 11, 16, 17, 19, 23-27 and 32 under 35 U.S.C. 102(b) as being anticipated by Bard (US 5,580,523).*

11. *Claims 1, 2, 10, 18, 19, 21 and 23-27 under 35 U.S.C. 102(b) as being anticipated by Koga et al. (US 5,270,127).*

With regard to the stated rejections of the above claims under 35 USC § 102 under Bard and Koga et al., applicant notes that all pending claims that were originally present (claims 4,6-13, 15-22, and 28-32 are now amended to depend on claim 33, which rewrites allowable claim 5 and includes the limitations of claim 1 and intervening dependent claims 2 and 3. Claims 23-27 relating to the operation of the apparatus are cancelled as unnecessary process limitations to the apparatus *per se*. In this regard, claim 33 defines a reactor module, such as shown in Figure 1C in which the relationships of the chamber block, heat exchanger and platform, in contrast with Bard and Koga et al. are defined. The reactor module comprises a chamber block having an inlet for the introduction of reactants therein and an outlet for the exit of reactant products therefrom and one or more one than one longitudinal

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cavity, capable of being charged with a catalyst, extending therethrough from the inlet to the outlet. A heat exchanger having first and second opposite sides with micro channel pathways for fluid flow on each side, having an inlet and an outlet in communication with the pathways on the opposite sides is aligned with the chamber block in a relationship in which an outlet of the one or more than one heat exchanger is in communication with an inlet of the one or more than one cavity in the chamber block. The block and heat exchange are disposed in a "U" shaped platform in which opposite sides of the "U" include orifices in operative correspondence the inlet and outlet of the heat exchanger, and secures the heat exchanger and the chamber block in alignment such that the bottom side of the "U" is spaced apart from the chamber block and defines a closed interior channel that allows fluid flow from an outlet of the heat exchanger to the inlet of the cavity or cavities in the chamber block.

The claims now dependent on claim 33, claims 10, 11, 16, 17, 18, 19, and 21 are further distinguished over Bard and Kowal *et al.* in that neither reference describes a reactor in accordance with claim 33 in which a cavity in the reactor includes a catalyst (Claim 10) which may be a powder, granule, pellet or extrudate (Claim 11). Likewise, in the reactor of claim 33, dependent claim 16 describes that cavities have a diameter of at least 1 centimeter; claim 17 and claim 18 describe cavity length less than 2.5 centimeters or corresponding to the length of the chamber block. Cavity arrangements in the block of the reactor of claim 33 are set out in claims 19-21. Applicant submits that neither the Bard nor Koga *et al.* references describe the overall subject matter claimed as pointed out above.

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***Claim Rejections - 35 USC § 103***

As a general proposition under 35 USC 103, it is a well established rule that for a rejection to be proper, a base reference must be used in combination with another reference(s), and the applied references, within their four corners, must suggest the combination of one with the other(s) to result in "the subject matter as a whole" of the claimed invention. The rejections under Section 103 expressed in Paragraphs 12-17 do not properly combine teachings of one reference with another, but rather rely on an unattributed assumption of "obviousness" based on single references that are not combined with further evidence of the state of the art. Hence, not complying with the well established rule under Section 103 that requires an evidentiary basis, the rejections are not properly founded. In addition, as to the rejections of paragraphs 12-17, the examiner concedes a base reference is "silent" as to stated subject matter, but assumes obviousness either on the basis of nothing, or an additional general reference that the Examiner does not specifically connect with the "silent" base. In any event, because the subject matter of all amended and new claims is intended to encompass matter indicated to be allowable, the foregoing distinction may be moot, but is nevertheless asserted to preserve applicant's rights.

12. *Claims 12-14, 18, 20, 21, 28 and 29 under 35 U.S.C. 103(a) applying Bard (US 5,580,523).*

As amended, claims 12-14, 18, 20, 21, 28 and 29 are rewritten to depend on claim 33 which restates allowable claim 5; hence, as claims 12-14, 18, 20, 21, 28 and 29 now depend from a claim having allowable subject matter, claims 12-14, 18, 20, 21, 28 and 29 are similarly allowable as to the stated parameters of embodiments

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having catalyst dimensions (claims 12 and 13), catalyst compositions (claim 14) and chamber parameters (claims 18, 20 and 21) set out in the referenced claims. The same rationale applies to the assembly and system embodiments that aggregate fluid flow streams defined in claims 28 and 29 which depend from allowable claim 33.

13. and 14. *Claim 30 under 35 U.S.C. 103(a) applying Bard (US 5,580,523) in view of O'Brien et al. (US 3,615,217) and claim 31 under 35 U.S.C. 103(a) applying Bard (US 5,590,523) in view of Chinchon (US 4,142,988).*

Claim 30 is amended to depend from claim 33 and is also amended to define an apparatus *per se* distinct from an intended use.

15. *Claims 3, 4, 6, 7, 15-17 and 22 under 35 U.S.C. 103(a) applying Koga et al. (US 5,270,127).*

Claim 3 is cancelled and incorporated in allowable claim 33. Claims 4, 6, 7, 15-17 and 22 are now dependent on allowable claim 33, defining the further parameters of orifices (claim 4), an open side (claim 6) and an exhaust cover (claim 7) of the defined heat exchanger, chamber block and platform configuration of the reactor of claim 33. Likewise, claims 15-17 and 22 define embodiments of the cavities and aggregations of the reactor of claim 33.

16. *Claims 11-14, 30 and 32 under 35 U.S.C. 103(a) in view of Koga et al. (US 5,270,127 and O'Brien et al. (US 3,615,217).*

Claims 11-14, 30 and 32 depend on claim 33 and relate to catalyst parameters of a reactor defined by the allowable claim. As the Examiner notes the teachings of Koga et al. and O'Brien are silent as to suitability of the catalysts; however, as the claims now depend on allowable claim 33, claims 11-14, 30 and 32 are similarly

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allowable as each defines a specific apparatus element in a novel and unobvious reactor.

17. Claim 11-14, 31 and 32 under 35 U.S.C. 103(a) in view of Koga et al. (US 5,270,127) and Chinchon (US 4,142,988).

Applicant repeats the comments of Paragraph 16, above. As claims 11-14, 31 and 32 now depend on allowable claim 33, claims 11-14, 30 and 32 are similarly allowable as each defines a specific apparatus element in a novel and unobvious reactor.

#### ***Allowable Subject Matter***

18. Claim 5 is rewritten as claim 33 including all of the limitations of the base claim 1 and intervening claims 2 and 3. Claims 8 and 9 are amended to state the equivalent, familiar, "screen" as opposed to the original "frit." The new set of claims 35-43 is added to better define embodiments of the invention consistent in scope with the allowable subject matter.

#### ***Conclusion***

19. The prior art of record is noted.

#### **VI. Applicant's Conclusion**

As evidenced by the foregoing amendment and remarks, applicant respectfully submits that the present application, now including independent claim 33 (formerly claim 5) and its dependent claims 4, 6-13, 15-22, and 28-34, and new independent claim 35 and its dependent claims 36-43, is in condition for allowance. Should the

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Examiner have any questions or suggestions in view of the foregoing, the Examiner is requested to telephone applicant's undersigned attorney.

Reexamination, reconsideration and allowance are respectfully requested.

Respectfully submitted,



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I hereby certify that this **RESPONSE TO THE OFFICIAL COMMUNICATION MAILED ON AUGUST 28, 2003** [including two (2) sheets of drawings] (25 pages), Transmittal Form PTO/SB/21 (1 page), Fee Determination Form PTO/SB/06 (1page) and Extension Form PTO/SB/22 (2 pages) are being filed by facsimile to 703-872-9306; Attention Group Art Unit 1764; Examiner Jennifer A. Leung on March 1, 2004.



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In the application:

Serial No.: 09/883,682  
Inventor: PHILLIPS, Cory  
Filed: June 18, 2001  
For: COMPACT REACTOR CAPABLE OF BEING CHARGED WITH CATALYTIC MATERIAL ...  
Group Art Unit: 1764  
Examiners: Jennifer A. Leung  
Atty. Docket No.: 3994994-134322

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